CONTENTS

List of committees ix

Preface xi

Plenary sessions

Limits of confinement: The first 15 years of ultra-relativistic heavy ion studies
H. Satz 3c

QCD in nuclear collisions
A.H. Mueller 20c

Important experimental observables at RHIC
D. Kharzeev 35c

Correlations, fluctuations, and flow measurements from the STAR experiment
R.L. Ray for the STAR Collaboration 45c

Results on correlations and fluctuations from NA49
C. Blume for the NA49 Collaboration 55c

Global observations from PHOBOS
M.D. Baker for the PHOBOS Collaboration 65c

Collective effects in microscopic transport models
C. Greiner 75c

Probing hadronization and freeze-out with multiple strange hadrons and strange resonances
M. Bleicher 85c

Introduction to the discussion on statistical models
A. Bialas 95c

Testing limits of statistical hadronization
J. Rafelski and J. Letessier 98c

Some remarks on the statistical model of heavy ion collisions
V. Koch 108c

Elementary hadronic interactions at the CERN SPS
H.G. Fischer for the NA49 Collaboration 118c

Soft physics in STAR
G. Van Buren for the STAR Collaboration 129c

Hyperon yields in Pb–Pb collisions from NA57 experiment
V. Manzari for the NA57 Collaboration 140c

Results on identified hadrons from the PHENIX experiment at RHIC
T. Chujo for the PHENIX Collaboration 151c

Recent results on spectra and yields from NA49
M. van Leeuwen for the NA49 Collaboration 161c

From $y = 0$ to $y = 3$: recent results from BRAHMS
I.G. Bearden for the BRAHMS Collaboration 171c

Jet physics at hadron colliders
Z. Kunszt 180c

High transverse momentum results from the STAR Collaboration
G.J. Kunde for the STAR Collaboration and the STAR-RICH Collaboration 189c

High p_T measurements from PHENIX
S. Mioduszewski for the PHENIX Collaboration 199c

Jet quenching
R. Baier 209c

The colour glass condensate
E. Iancu 219c

Recent lattice results relevant for heavy ion collisions
K. Kanaya 233c

Results on leptonic probes from NA50
L. Ramello for the NA50 Collaboration 243c

Leptonic observables in ultra-relativistic heavy ion collisions
J.L. Nagle for the PHENIX Collaboration 252c

Latest results from CERES/NA45
J.P. Wessels for the CERES/NA45 Collaboration 262c

Jets and dijets in Au + Au and p + p collisions at RHIC
D. Hardtke for the STAR Collaboration 272c

First results from the HERA-B experiment
A. Zoccoli for the HERA-B Collaboration 280c

How quantum mechanics of the Yang–Mills fields may help us understand the RHIC puzzles
E.V. Shuryak 289c

Results of the hydrodynamics approach to heavy ion collisions
P. Huovinen 299c

Structure functions and parton distributions
J. Qiu 309c

Lattice QCD results at finite temperature and density
Z. Fodor 319c

QCD calculations of thermal photon and dilepton production
F. Gelis 329c

Particle density fluctuations
B. Mohanty for the WA98 Collaboration 339c

Summary of results on hard probes
T. Peitzmann 349c

Charm and leptons
P. Crochet 359c

Strangeness: A summary
D. Röhrich 369c

Anisotropic flow
S.A. Voloshin 379c

Correlations and fluctuations, a summary of Quark Matter 2002
S. Pratt 389c

Experimental summary on global observables, hadron spectra and ratios
T.S. Ullrich 399c

Theory at Quark Matter '02
R.D. Pisarski 412c

Hadronic matter at high baryon density
J. Wambach 422c

Physics of LHC (theory)
K. Kajantie 432c

Experiments at the LHC
P. Giubellino 441c

Parallel sessions

Particle yields – experiment

Energy dependence of Λ and $\bar{\Lambda}$ production at CERN-SPS energies
A. Mischke for the NA49 Collaboration 453c

Mid-rapidity $\pi^{\pm}$, $K^{\pm}$, and $\bar{p}$ spectra and particle ratios from STAR
O. Barannikova and F. Wang for the STAR Collaboration 458c

$\rho(770)^0$, $K^*(892)^0$ and $f_0(980)$ production in Au–Au and pp collisions at $\sqrt{s_{NN}} = 200$ GeV
P. Fachini for the STAR Collaboration 462c

Mid-rapidity ϕ production in Au + Au collisions at $\sqrt{s_{NN}} = 200$ GeV
E. Yamamoto for the STAR Collaboration 466c

Ω^- and $\bar{\Omega}^+$ production in Au + Au collisions at $\sqrt{s_{NN}} = 130$ and 200 GeV
C. Suire for the STAR Collaboration 470c

System size dependence of strangeness production at 158 A GeV
C. Höhne for the NA49 Collaboration 474c

Rapidity dependence of charged particle yields for Au + Au at $\sqrt{s_{NN}} = 200$ GeV
D. Ouerdane for the BRAHMS Collaboration 478c

Rapidity dependent net-proton yields in Au + Au at $\sqrt{s_{NN}} = 200$ GeV
J.H. Lee for the BRAHMS Collaboration 482c

Charge particle multiplicity and transverse energy measurements in Au–Au collisions in PHENIX at RHIC
A. Bazilevsky for the PHENIX Collaboration 486c

Universal behavior of charged particle production in heavy ion collisions
P.A. Steinberg for the PHOBOS Collaboration 490c

ϕ meson production in Au–Au collisions at $\sqrt{s_{NN}} = 200$ GeV
D. Mukhopadhyay for the PHENIX Collaboration 494c

Source parameters from identified hadron spectra and HBT radii for Au–Au collisions at $\sqrt{s_{NN}} = 200$ GeV in PHENIX
J.M. Burward-Hoy for the PHENIX Collaboration 498c

Baryon and antibaryon production in hadron–hadron and hadron–nucleus interactions
M. Kreps for the NA49 Collaboration 502c

Hadron formation in a nuclear environment at HERMES
V. Muccifora for the HERMES Collaboration 506c

Identified particles in Au + Au collisions at $\sqrt{s_{NN}} = 200$ GeV
B. Wosiek for the PHOBOS Collaboration 510c

Results on 40 A GeV/c Pb–Pb collisions from the NA57 experiment
D. Elia for the NA57 Collaboration 514c

Ξ^- and $\bar{\Xi}^+$ baryon production in Au + Au collisions at $\sqrt{s_{NN}} = 130$ GeV
J. Castillo for the STAR Collaboration 518c

Coherent vector meson production in ultra-peripheral heavy-ion collisions at STAR
F. Meissner for the STAR Collaboration 522c

Heavy quarks/particle yields – theory

Statistical hadronization of charm at SPS, RHIC and LHC
A. Andronic, P. Braun-Munzinger, K. Redlich and J. Stachel 529c

Charmonium absorption in the meson-exchange model
Z. Lin and C.M. Ko 533c

The cross sections between charmonia and comovers within pQCD
P.-B. Gossiaux, J. Aichelin, F. Arleo and T. Gousset 537c

The role of produced hadrons in J/ψ suppression
C.-Y. Wong, T. Barnes, E.S. Swanson and H.W. Crater 541c

Two-component approach to J/ψ production in high-energy heavy-ion collisions
L. Grandchamp and R. Rapp 545c

Understanding bottom production
N. Kidonakis, E. Laenen, S. Moch and R. Vogt 549c

Towards strangeness saturation in central heavy-ion collisions at high energies
J. Cleymans, B. Kämpfer and S. Wheaton 553c

Strange quark production in an effective statistical model
F. Becattini and G. Pettini 557c

Transverse spectra of hadrons at RHIC
K.J. Eskola, H. Niemi, P.V. Ruuskanen and S.S. Räsänen 561c

Canonical aspects of strangeness enhancement
A. Tounsi, A. Mischke and K. Redlich 565c

Statistical hadronization of charmed quarks at SPS and RHIC
A.P. Kostyuk 569c

Baryonic coherent state formation from small domain disoriented chiral condensates
S.M.H. Wong and J.I. Kapusta 573c

Correlations/fluctuations – experiment

Photon flow in 158 A GeV Pb + Pb collisions
S. Nikolaev for the WA98 Collaboration 579c

Directed and elliptic flow in Pb + Pb collisions at 40 and 158 A GeV
A. Wetzler, N. Borghini, P.M. Dinh, J.-Y. Ollitrault, A.M. Poskanzer, S.A. Voloshin and the NA49 Collaboration 583c

Transverse dynamics at RHIC
N. Xu and Z. Xu 587c

Non-identical particle correlation analysis as a probe of transverse flow
F. Retière for the STAR Collaboration 591c

Two-particle correlations measured by PHENIX in Au–Au collisions at $\sqrt{s_{NN}} = 200$ GeV
A. Enokizono for the PHENIX Collaboration 595c

Identified charged particle azimuthal anisotropy in PHENIX at RHIC
S. Esumi for the PHENIX Collaboration 599c

Charge fluctuations at mid-rapidity in Au + Au collisions in the PHENIX experiment at RHIC
J. Nystrand for the PHENIX Collaboration 603c

Two-pion Bose–Einstein correlations at SPS energies
H. Tilsner and H. Appelshäuser for the CERES Collaboration 607c

Flow and Bose–Einstein correlations in Au–Au collisions at RHIC
S. Manly for the PHOBOS Collaboration 611c

Flow and non-flow event anisotropies at the SPS
J. Slivová for the CERES/NA45 Collaboration 615c

Measurement of source chaoticity for particle emission in Au + Au collisions at $\sqrt{s_{NN}} = 130$ GeV using 3-particle HBT correlations
R. Willson for the STAR Collaboration 619c

Identical particle interferometry at STAR
M. Lopez Noriega for the STAR Collaboration 623c

Correlations/fluctuations – theory

Analysis of directed flow from three-particle correlations
N. Borghini, P.M. Dinh and J.-Y. Ollitrault 629c

Measuring the jet azimuthal anisotropy without reconstruction of the reaction plane
I.P. Lokhtin, L.I. Sarycheva and A.M. Snigirev 633c

Possible origin of RHIC R_{out}/R_{sid} HBT results
S.S. Padula 637c

Comparison of hadronic rescattering calculations of elliptic flow and HBT with measurements from RHIC
T.J. Humanic 641c

The universal freeze-out criterion at SPS and RHIC
B. Tomasik and U.A. Wiedemann 645c

Elliptic flow from partially thermalized heavy-ion collisions
U. Heinz and S.M.H. Wong 649c

Emission angle dependent HBT at RHIC and beyond
P.F. Kolb and U. Heinz 653c

Strange fluctuations at RHIC
M. Abdel-Aziz and S. Gavin 657c

Net charge dynamic fluctuations
C. Pruneau, S. Gavin and S. Voloshin 661c

ϕ meson production at RHIC
L. Bravina, L. Csernai, A. Faessler, C. Fuchs, S. Panitkin, N. Xu and E. Zabrodin 665c

Elliptic flow from color glass condensate
A. Krasnitz, Y. Nara and R. Venugopalan 669c

Leptons/photons – experiment

Transverse momentum distribution of J/ψ produced in Pb–Pb and p–A interactions at the CERN SPS
N.S. Topilskaya for the NA50 Collaboration 675c

Charmonia absorption in p–A collisions at the CERN SPS results and implications for Pb–Pb interactions
P. Cortese for the NA50 Collaboration 679c

Results on photon production in Au + Au collisions at RHIC
K. Reygers for the PHENIX Collaboration 683c

$J/\psi \to ee$ and $J/\psi \to \mu\mu$ measurements in AuAu and pp collisions at $\sqrt{s_{NN}} = 200$ GeV
A.D. Frawley for the PHENIX Collaboration 687c

Measurements of photon and π^0 production in heavy ion collisions at RHIC
I.J. Johnson for the STAR Collaboration 691c

Single leptons from heavy-flavor decays at RHIC
R. Averbeck for the PHENIX Collaboration 695c

Leptons/photons – theory

Hadron correlators, spectral functions and thermal dilepton rates from lattice QCD
F. Karsch, S. Datta, E. Laermann, P. Petreczky, S. Stickan and I. Wetzorke 701c

Energy loss of quarks in deconfined matter at RHIC: photon-tagged jets, single electron and dilepton spectra from open charm
K. Gallmeister, B. Kämpfer and O.P. Pavlenko 705c

Dileptons and photons from coarse-grained microscopic dynamics and hydrodynamics compared to experimental data
J. Kapusta 709c

γ-radiation of thermalized quark–gluon-plasma
H. Zaraket 713c

On hydrodynamical description of thermal photons
S.S. Räsänen 717c

High transverse momentum – experiment

High p_T π^0 production and angular correlations in 158 A GeV p + A and Pb + Pb collisions
S. Bathe for the WA98 Collaboration 729c

High p_T inclusive charged hadron spectra from Au + Au collisions at $\sqrt{s_{NN}} = 200$ GeV
J.L. Klay for the STAR Collaboration 733c

Azimuthal anisotropy of charged and identified high p_T hadrons in Au + Au collisions at RHIC
K. Filimonov for the STAR Collaboration and the STAR-RICH Collaboration 737c

High p_T measurements with BRAHMS
C.E. Jørgensen for the BRAHMS Collaboration 741c

Charged hadron transverse momentum distributions in Au + Au collisions at $\sqrt{s_{NN}} = 200$ GeV
C. Roland for the PHOBOS Collaboration 745c

High-p_T π^0 suppression in Au + Au collisions at $\sqrt{s_{NN}} = 200$ GeV
D. d'Enterria for the PHENIX Collaboration 749c

Measurement of the neutral pion cross section in proton–proton collisions at $\sqrt{s} = 200$ GeV with PHENIX
H. Torii for the PHENIX Collaboration 753c

High-p_T identified hadron ratios in $\sqrt{s_{NN}} = 200$ GeV Au + Au collisions
T. Sakaguchi for the PHENIX Collaboration 757c

Charged particle angular correlations from leading photons at RHIC
M. Chiu for the PHENIX Collaboration 761c

Two particle azimuthal correlation measurements in PHENIX
N.N. Ajitanand for the PHENIX Collaboration 765c

Charged hadron spectra in PHENIX
J. Jia for the PHENIX Collaboration 769c

High transverse momentum – theory

Probe initial parton density and formation time via jet quenching
X.-N. Wang 775c

High-p_T pion quenching versus anti + baryon enhancement in nucleus–nucleus collisions
I. Vitev and M. Gyulassy 779c

Determining the BDMPS transport coefficient via medium-modified fragmentation functions
C.A. Salgado and U.A. Wiedemann 783c

Jet quenching with detailed balance in a thermal QCD medium
E. Wang and X.-N. Wang 787c

Centrality dependence of the multiplicity and transverse momentum distributions at RHIC and LHC and the percolation of strings
M.A. Braun, F. del Moral and C. Pajares 791c

Prompt photon and inclusive π^0 production at RHIC and LHC
S. Jeon, J. Jalilian-Marian and I. Sarcevic 795c

Transport theory

Particle correlations at RHIC – scrutiny of a puzzle
S. Soff, S.A. Bass, D.H. Hardtke and S.Y. Panitkin 801c

Kinetic equilibration in heavy ion collisions: the role of elastic processes
J. Serreau 805c

Dynamics of particle production in relativistic nuclear collisions
K. Tuominen 809c

Parton rescattering and colour screening in Au + Au collisions at RHIC
S.A. Bass, B. Müller and D.K. Srivastava 813c

Viscous corrections to spectra, elliptic flow, and HBT radii
D. Teaney 817c

Collective flow and HBT radii from a full 3D hydrodynamic model with early chemical freeze out
T. Hirano and K. Tsuda 821c

Astrophysics/instrumentation

Relics of cosmic quark–hadron phase transition and massive compact halo objects
S. Banerjee, A. Bhattacharyya, S.K. Ghosh, S. Raha, B. Sinha and H. Toki 827c

Mapping deconfinement with a compact star phase diagram
H. Grigorian, D. Blaschke and G. Poghosyan 831c

Observability of neutron stars with quarks
M. Prakash, J.M. Lattimer, A.W. Steiner and D. Page 835c

The ALICE dimuon spectrometer
A. Baldisseri for the ALICE Collaboration 839c

The time projection chamber for the ALICE experiment
L. Musa for the ALICE Collaboration 843c

The ALICE silicon pixel detector
P. Chochula, F. Antinori, G. Anelli, M. Burns, M. Campbell, M. Caselle, R. Dinapoli, D. Elia, R.A. Fini, F. Formenti, J.J. van Hunen, S. Kapusta, A. Kluge, M. Krivda, V. Lenti, V. Manzari, F. Meddi, M. Morel, P. Nilsson, A. Pepato, P. Riedler, R. Santoro, G. Stefanini and K. Wyllie 849c

Theory

The deconfined phase near T_c and its decay into hadrons
A. Dumitru and R.D. Pisarski 855c

Structure change of Cooper pairs in color superconductivity – crossover from BCS to BEC?
K. Itakura 859c

Hadronic spectral functions above the QCD phase transition
M. Asakawa, T. Hatsuda and Y. Nakahara 863c

The crystallography of color superconductivity
J.A. Bowers and K. Rajagopal 867c

Taming the BFKL intercept via gluon saturation
A. Kovner and U.A. Wiedemann 871c

Thermal description of transverse-momentum spectra at RHIC
W. Florkowski and W. Broniowski 875c

Effective theory of the color–flavor-locked phase
T. Schäfer 879c

Color confinement and dual superconductivity in unquenched QCD
J.M. Carmona, M. D'Elia, L. Del Debbio, A. Di Giacomo, B. Lucini, G. Paffuti and C. Pica 883c

Scattering through QCD sphalerons
I. Zahed 887c

Elliptic flow from parton saturation
Y.V. Kovchegov 891c

New results for hadronic collisions in the framework of the parton-based Gribov–Regge theory
T. Pierog, H.J. Drescher, F. Liu, S. Ostaptchenko and K. Werner 895c

Tomography of nuclear matter: comparing Drell–Yan with deep inelastic scattering data
F. Arleo 899c

Appendix

Members of:

ALICE Collaboration 905c

BRAHMS Collaboration 908c

HERMES Collaboration 909c

NA49 Collaboration 911c

PHENIX Collaboration 912c

STAR Collaboration 916c

STAR-RICH Collaboration 919c

Author index 921c